

REMARKS

This amendment is in response to the Office Action received in the above referenced application mailed on March 25, 2004. Upon entry of this amendment, claims 1-3, 5-21, 23, 25-26, 28-29, and 31 – 46 are pending in this application. Claims 4, 22, 24, 27 and 30 are canceled. New claims 31 – 46 are added.

Amendments to the Specification

Applicants have amended the specification of the present application to correct informalities, inconsistencies and typographical errors. Accordingly, it is believed that all amendments to the specification are fully supported by the disclosure, figures and the claims originally filed, and, as such, no new matter has been added. The references provided in connection with the amendments are only representative citations in the application that speak to or support the subject matter and scope of the amendment.

With respect to the amendments on page 5, line 10 to page 6, end, the inadvertent capitalization of the word “1,8-Naphthoylene...” has been amended to properly read “1,8-naphthoylene...” Punctuation errors have also been amended. In addition, the integer *z* has been amended in structures I – III, V and VII. Support for *z* can be found on page 5, lines 10 – 16 and page 9, lines 10 – 16, namely “*z* is an integer in the range of 0 to 6[.]” From the perspective of a skilled artisan in the field of chemistry, general formula D as well as the synthesis of exemplary embodiments, *e.g.*, see, page 15, line 7 to page 16, line 11, claim language in original claim 1 and Examples 1 – 4, of the present invention enables and supports this amendment.

With respect to the amendments on page 9, lines 8 – 11, the language has been clarified to read “...benzimidazole water-soluble sulfoderivative compounds...”

In reference to the amendments on page 9, line 17 to page 10, end, minor typographical and punctuation errors have been made. The word “...1,8-Naphthoylene...” now reads “...1,8-naphthoylene...” Punctuation errors have also been amended. In addition, the integer *z* has been amended in structures I – III, V and VII. Support for *z* can be found on page 5, lines 10 – 16 and page 9, lines 10 – 16, namely “*z* is an integer in the range of 0 to 6[.]” From the perspective of a skilled artisan in the field of chemistry, general formula D as well as the synthesis of exemplary

embodiments, *e.g.*, see, page 15, line 7 to page 16, line 11 and Examples 1 – 4, of the present invention enables and supports this amendment.

On page 20, line 6, the value for measured m/z has been amended to read “509.1”.

Finally, the typographical error in the phrase “1,8-naphthoylene-1',2'-benzimidazole6'sulfonic acid” on page 20, line 15, has been corrected to read “1,8-naphthoylene-1',2'-benzimidazole-6'sulfonic acid”.

Amendments to the Claims

Applicants have amended the claims of the present application. The support provided for each amendment, clarification and correction are only intended to be representative citations among others in the application. Since these clarifications, amendments and corrections are fully supported by the disclosure, figures and the claims originally filed, it is believed that no new matter has been added.

General structural formulas D' and D" in claim 1 have been added in view of the Examiner's rejections to claim 1. In addition, claim 1 has been rewritten for the sake of format and presentation of the claims. Minor typographical and grammatical errors have also been addressed by amendment. Support for general structural formula D' and D" can be found on page 5, line 10 to page 6 (end); page 9, line 8 to page 11, line 5; page 15, line 7 to page 16, line 12, the claim language in original claim 1 and Examples 1 – 4. The additional phrase “wherein at least one of the sulfonic groups occupies position 2, 3, 6 or 7” for D" is supported by and deduced from Examples 1 – 4, page 5, lines 10 – 16 and page 9, lines 10 – 16 in connections with the synthesis disclosed on page 15, line 7 to page 16, line 11.

Similarly, claim 2 has been amended to correct typographical and punctuation errors in the claim language. More specifically, the integer z has been amended in structures I – VIII to comport with the general structural formulas in claim 1, which claim 2 depends, namely the requirement that “ z is an integer in the range of 0 to 6”. Support for z can be found on page 5, lines 10 – 16, page 6, lines 10 – 16 and the claim language in original claim 1. In addition, the phrase “SO₃⁻ group occupies position 2, 3, 6 or 7[,]” in reference to structure II, has been added to overcome the references cited by the Examiner. Support for this amendment can be found on

page 5, lines 10 – 16, Examples 1 – 4 and page 9, lines 10 – 16 in connection with the synthesis disclosed on page 15, line 7 to page 16, line 11. Further, structure IV has been amended such that one sulfonate group resides on position 2 or 3 and the second sulfonate group resides on position 6 or 7. Support for this amendment can be found on page 5, lines 10 – 16, the language in original claim 1, Examples 1 – 4 and page 9, lines 10 – 16 in connection with the synthesis disclosed on page 15, line 7 to page 16, line 11.

Informalities and typographical errors in claims 3 and 5 have also been amended.

Claim 4, 22, 24, 27 and 30 have been canceled without prejudice.

Claim 6 has been rewritten in independent form. Support for D and structure I – VIII can be found, for example, on page 5, line 10 to page 6 (end), page 9, line 8 to page 11, line 5, page 15, line 7 to page 16, line 12, the claim language in original claim 1 and Examples 1 – 4.

Claim 7 has been amended to clarify the claim language. Claim 8 has also been amended to clarify an individual sulfoderivative from a mixture of sulfoderivatives. Support for this clarification can be found, for example, on page 17, lines 3 – 9.

Claims 9 – 17 have been amended to show proper dependence. Claims 16 and 17 have also been amended to clarify the claim language. Support for clarifications to claim 16 can be found on page 13, line 13 to page 14, line 15. Support for clarifications to claim 17 can be found on page 12, line 9 to page 13, line 17 and page 15, lines 1 – 6.

Claim 18 has been rewritten in independent form incorporating the drawings from claim 2, which claim 18 had previously depended therefrom. Support can be found on page 5, line 20 to page 6 (end), page 9, line 19 to page 11, line 5, page 15, line 7 to page 16, line 12 and Examples 1 – 4.

Redundancies in claim 19 have been deleted since, for example, deleted phrase “structures I and II” are monosulfoderivatives.

Claim 20, 21, 23, 25, 26, 28 and 29 have been amended to show proper dependence. Claims 20, 23 and 26 have also been amended to clarify the claim language. Support can be found on page 12, line 9 to page 13, line 17 and page 15, lines 1 – 6.

New Claims 31 – 46

New claims 31 – 46 have been added to claim additional features of the invention. Support for claims 31 – 34 can be found on page 5, line 10 to page 6 (end), page 9, line 8 to page 11, line 14, page 15, line 7 to page 16, line 12, the claim language in original claim 1 and Examples 1 – 4. Support for claims 35 can be found on page 12, lines 19 – 21. Whereas, support for claim 36 can be found on page 11, lines 12 – 14 and Example 5.

New claim 37 can find support on page 8, line 25 to page 7, line 7, page 11, lines 17 – 24; page 15, lines 1 – 6, page 16, lines 12 – 19 and page 17, lines 3 – 12. Support for claim 38 can be found on page 7, line 25 to page 8, line 8, page 11, lines 6 – 14, page 15, lines 1 – 4 and page 16, lines 12 – 19.

New claim 39 can find support on page 17, lines 14 – 16. Support for claim 40 can be found on page 11, lines 15-26, page 17, lines 16 – 22 and Figure 1. Similarly, new claims 41 – 42 can find support on page 13, line 13 to page 14, line 15.

Furthermore, support for new claims 43 – 45 can be found on page 12, lines 21 – 27 and page 17, lines 9 – 16.

Finally, support for new claim 46 can be found on page 9, lines 3 – 7.

Amendments to the Drawings

Figures 1, 2a, 2b, 3a and 3b have been amended to correct typographical and incidental errors in the drawings that do not add new matter.

In figures 1, 2a, 2b, 3a and 3b, the word “wavelength, nm” has been amended to recite “wavelength (nm)”. In addition, in each figure, the horizontal scale has been amended to properly align with the graph. Support for these amendments can be found in the Russian patent

application, which the present application claims priority. Attached hereto is a marked-up version of the figures and the original figures from the Russian patent application.

Summary of the Office Action

The Examiner rejects Claims 1, 8 and 17 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter.

Claims 1, 2 and 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by JP 51-111,237 (“the ‘237 reference”).

The Examiner rejects Claims 1, 2 and 5 under 35 U.S.C. § 102(b) as being anticipated by JP 52-72,726 (“the ‘726 reference”).

Applicants respectfully traverse these rejections.

Claims 3, 4, 6, 7, 9 – 16 and 18 – 30 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitation of the base claim and any intervening claims.

Rejection Under 35 U.S.C. § 112 (2)

Claims 1, 8 and 17 are rejected under 35 U.S.C. § 112 (2) as being indefinite for failing to particularly point out and distinctly claim the subject matter. Applicants have amended the claims by pointing out and defining that m is “an integer in the range of 0 to 4.” Support for the range can be found throughout the specification and original claims of the present application, e.g., page 5, lines 10 – 16, page 9, lines 10 – 16, page 15, line 7 to page 16, line 12, the claim language in original claim 1 and Examples 1 – 4.

Claim 8 has also been amended to depend from claim 6 and to remove the vagueness in the word “a mixture” in view of claim 7, which discloses an individual sulfoderivative. Applicants have further amended claim 8 by defining a mixture as comprising “at least two said individual 1,8-naphthoylene-1',2'-benzimidazole sulfoderivatives.” Support for “a mixture” of sulfoderivatives can, for example, be found on page 12, line 9 to page 13, line 17.

The language in claim 17 has been clarified and amended to include the language “at least one of said mixture of at least two individual sulfoderivatives differs only at the X and/or

Y” substituent. Support for amended claim 17 can be found, for example, on page 12, lines 9 – 13, page 15, lines 1 –6 and page 13, lines 13 – 17.

Applicants respectfully requests withdrawal of this rejection.

Rejections Under 35 U.S.C. § 102 (b)

The Examiner rejects Claim 1, 2 and 5 under 35 U.S.C. § 102 (b) as being anticipated by JP 51-111237 (“the ‘237 publication”). Applicants submit that the claims are patentable over the cited reference.

A claim is anticipated under 35 U.S.C. §102 only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference. Applicants respectfully submit that the cited references do not teach each and every element of the amended claims of the present invention.

The ‘237 publication discloses sulfoderivatives having only one sulfonate group on the naphthoylene moiety. The ‘237 publication teaches such a compound for use as a dye. The Applicants have amended claim 1 by reciting the limitation that “p is an integer in the range of 1 to 2,” with respect to D', and “SO₃⁻ group occupies position 2, 3, 6 or 7,” with respect to D". The ‘237 publication does not teach or suggest Applicants’ amended claims 1, 2 and 5. Even if the ‘237 publication arguably teaches a sulfonate group on the naphthoylene moiety, the ‘237 publication teaches neither a sulfonate group on the benzimidazole nor a sulfonate group on position 2, 3, 6 or 7.

Further, the ‘237 publication does not disclose or suggest a lyotropic liquid crystal system comprising at least one 1,8-naphthoylene-1',2'-benzimidazole sulfoderivative according to claim 6 of the subject application.

The Examiner further rejects claims 1, 2 and 5 under 35 U.S.C. §102(b) as anticipated by referenced JP 52-72726 (“the ‘726 publication”). Applicants submit that the claims are patentable over the cited reference.

The ‘726 publication teaches sulfoderivatives having two sulfonate groups at positions 4 and 5 on the naphthoylene moiety. The ‘726 publication does not teach or suggest Applicants’

amended claims 1 and 2. Even if the '726 publication arguably teaches two sulfonate groups at positions 4 and 5, the '726 publication does not anticipate D', which has at least one sulfonate group on the benzimidazole ring, or D", specifically structure IV, since the amended structure IV now shows that the first sulfonate group resides on position 2 or 3 accompanied by a second sulfonate group that resides on position 6 or 7. Additionally, the '726 publication is directed solely to compounds used as water soluble dyes and does not disclose or suggest a lyotropic liquid crystal system comprising at least one 1,8-naphthoylene-1',2'-benzimidazole sulfoderivative as recited in claim 6 of the subject application.

Further, for at the same reasons, neither do the '237 nor '726 references teach or suggest Applicants' new claims. Claim 20 has been amended to depend from new claim 31 which recites an optically anisotropic film comprising at least one 1,8-naphthoylene-1',2'-benzimidazole sulfoderivative of the broad formula. Applicants submit that claim 31 (and all claims depending there from) are not taught or suggested by the cited references. The teachings of the cited references are limited to certain sulfoderivate compounds used as dyestuffs. Nowhere is there any teaching or suggestion of an optically anisotropic film comprising at least one 1,8-naphthoylene-1',2'-benzimidazole sulfoderivative as recited in Applicants' claims. In contrast, the cited references teach water-soluble dyes used for dyeing fibrous materials and the dyes are dispersed in solution. These water solutions of dyes exhibit low concentration and cannot form a liquid crystal phase or anisotropic film as recited in Applicants' claims.

Allowable Subject Matter

Applicants acknowledge with appreciation the allowance of claims 3-4, 7, 9-16 and 18-30 if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Since claims 1 and 2 have been amended, the objection to claim 3, which depend therefrom, is rendered moot. Furthermore, because claims 6 and 18 have been rewritten in independent form, claims 7 and 9 – 16 and claim 19, which depend therefrom, respectively, dependent claims 7, 9 – 16 and 19 are in condition for allowance.

Objected claims 22, 24, 27 and 30 have been canceled without prejudice.

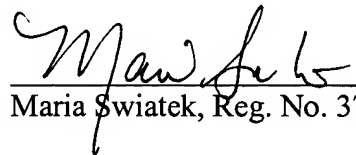
Objected claims 20, 23, 25, 26, 28 and 29 now depend from independent new claim 31.

CONCLUSION

In view of the foregoing, Applicants submit that the aforementioned claims are now in condition for allowance and respectfully request an early and favorable action. If any matters can be resolved by telephone, the Examiner is invited to call the undersigned attorney at the telephone number listed below. The Commissioner is hereby authorized to charge any other fees determined to be due to Dorsey & Whitney's Deposit Account 50-2319 (Order No. A-72153/AJT/MSS/SSR (463031-97)).

Respectfully submitted,

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In the Drawings

Figures 1, 2a, 2b, 3a and 3b have been amended to correct for typographical and incidental errors in the drawings that do not add new matter. For the sake of clarity, a marked-up version is attached hereto.

Upon approval of the changes by the Examiner, Applicants will submit replacement drawing sheets that incorporate the proposed corrections. As support, Applicants attach the original figures from the Russian patent application 2002117253, filed on June 2002, which the present application claims priority.

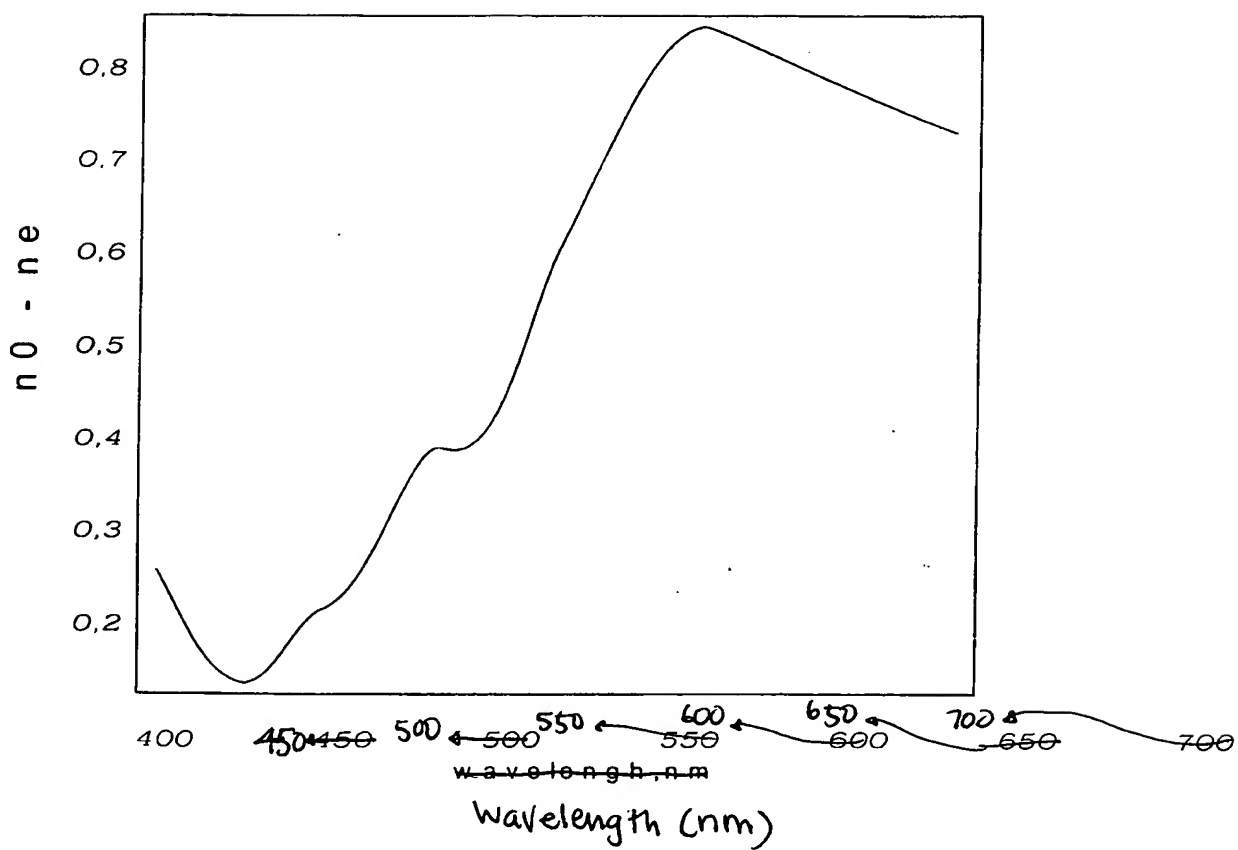


Fig . 1

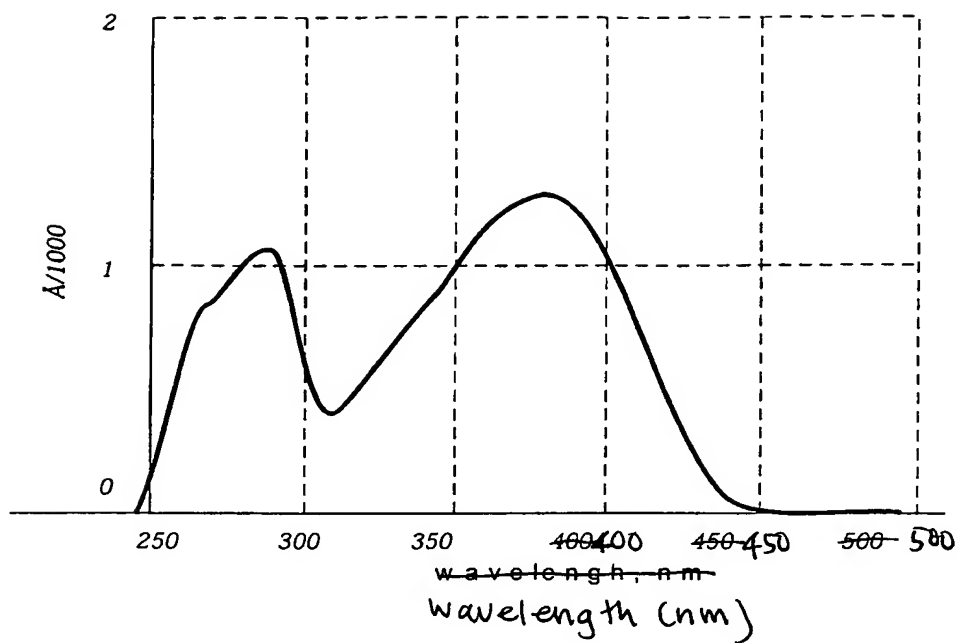


Fig. 2 a

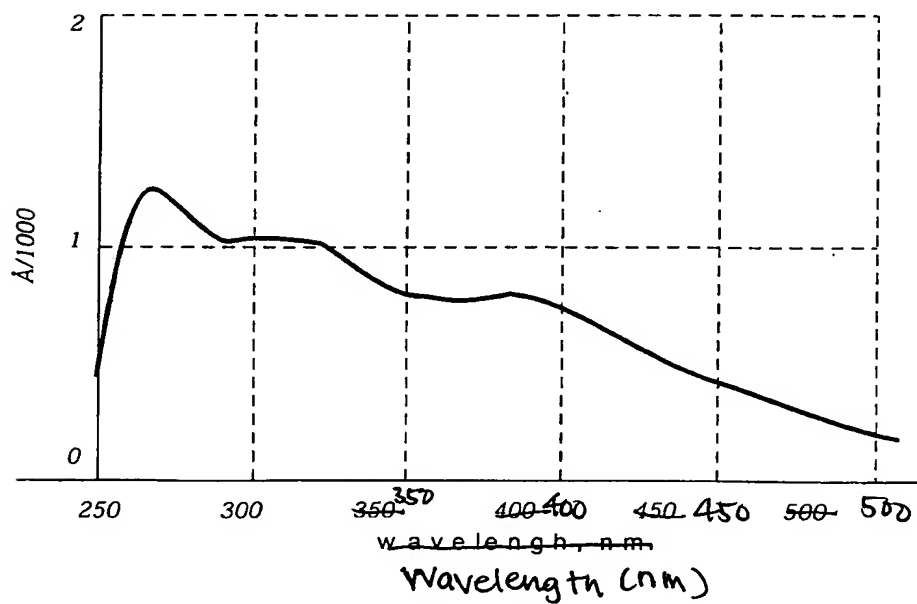


Fig. 2 b

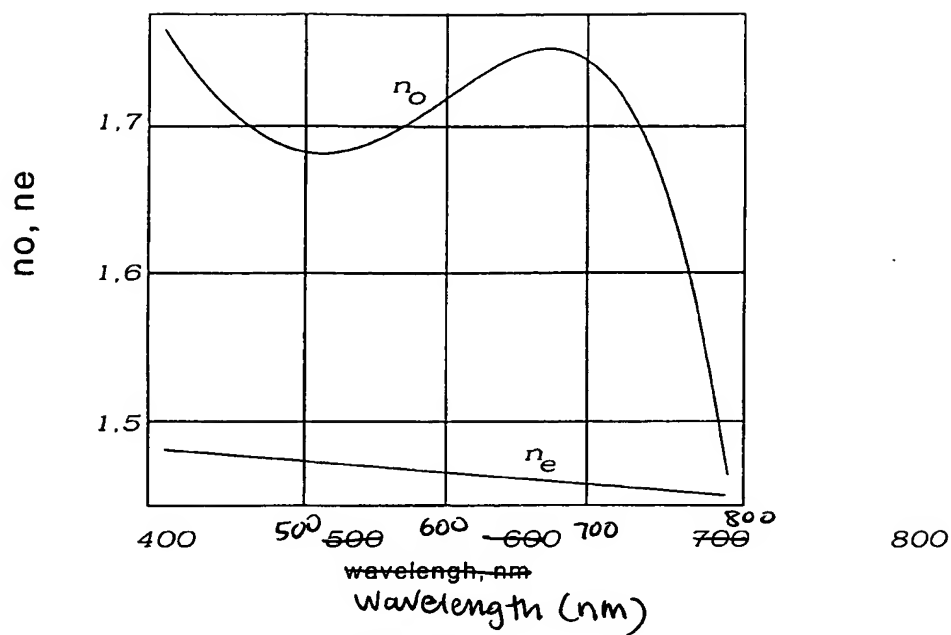


Fig. 3a

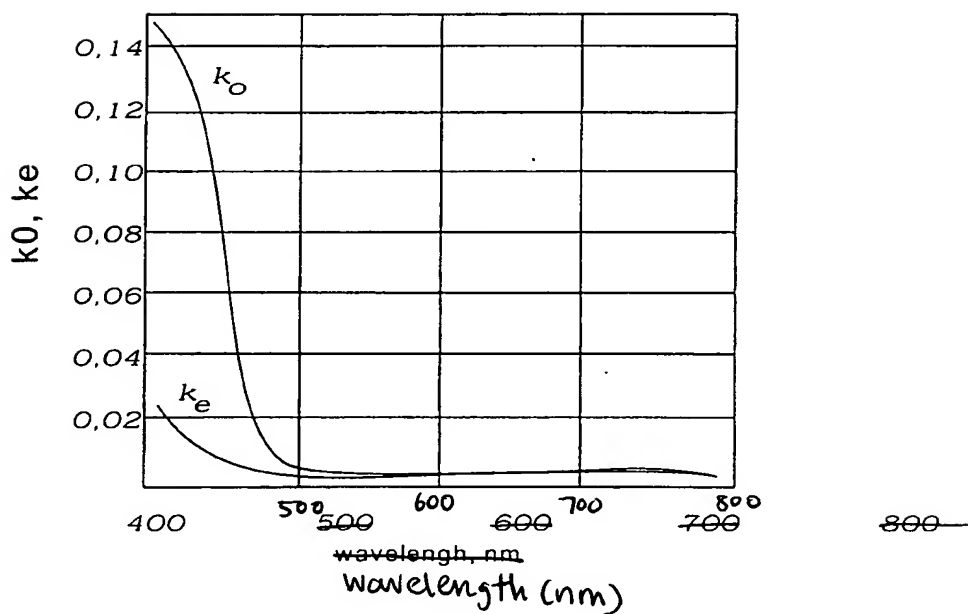


Fig. 3b